PARACENTESIS THORACIS.

An Analysis of Twenty-Five Cases

OF

PLEURITIC EFFUSION,

IN WHICH THIS OPERATION WAS PERFORMED.

READ BEFORE THE BOSTON SOCIETY FOR MEDICAL OBSERVATION, NOVEMBER 22, 1853.

FROM THE

AMERICAN MEDICAL MONTHLY,

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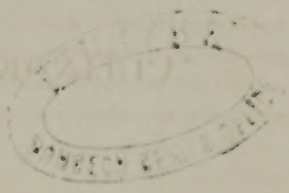
NEW YORK:
BAKER, GODWIN & CO., PRINTERS,
CORNER NASSAU AND SPRUCE STREETS.
1853.



PARACENTESIS THORACIS.

An analysis of twenty-five cases of Pleuritic Effusion, in which this operation was performed. By Henry I. Bowditch, M. D., one of the Physicians of the Massachusetts General Hospital, and Member of the Societies for Medical Observation at Paris and Boston.

In 1851 I presented to the Society, and subsequently published, some cases* in which Paracentesis Thoracis had been performed. I propose, in this paper, to continue the consideration of that subject. For this purpose, I shall present an analysis of my preceding paper, together with the records of sixteen more cases, in which I have operated or have seen others operate, since that publication. I shall give a tabular statement of some of the prominent features of the twenty-five cases which have fallen under my notice since April 17, 1850, with several inferences therefrom, and shall conclude with a brief account of a paper on the subject, published recently (Oct., 1853) in the *Archives Générales de Médecine.*

Analysis of my Previous Paper.

In the paper above alluded to, I briefly stated the facts relative to the history of the operation, and to the state of medical opinion on the subject. The operation, having been suggested by earlier writers, has never been used freely until since Laennec's discovery has enabled us to make our diagnosis more accurate than was possible without auscultation. Since 1843, Trousseau, Barby, Reybard, Schuh, Raciborski, and others, have performed it on the continent of Europe, while Messrs. Hughes and Cock, Hamilton Roe, &c., have operated in England. There has been, however, an unwillingness on the part of the great body of the profession, in Europe and this country, to look upon the operation with favor. My own experience had, however, led me, for many years, to think that some method should be devised for the *easy* and *safe* removal of fluid effused into the pleural cavity. I had seen patients die from simple effusion, I had seen others gradually fall in phthisis, or slowly recover, after perhaps years of misery, with a distorted trunk and shattered health. I asked the surgeon's best aid—by the scalpel. The result was very unsatisfactory. Finally, from Dr. Wyman, of Cambridge, I learned the use of the *small exploring trochar and canula*, as he had applied it a few weeks before, in the case of one of his patients. I saw, at a glance,

* American Journal of Medical Sciences for April, 1852. Article on Paracentesis Thoracis, previously presented to the Boston Society for Medical Observation.

the great value of his method. A full description of it may be found in my first paper. It is sufficient, for my present purpose, to say that a strong *exploring* trochar and canula have, in all the cases I shall present, been introduced, usually between the 9th and 11th ribs, and below the angle of the scapula. To this canula, by means of an air-tight apparatus, a strong suction pump has been attached, and the fluid has been drawn out, without the possibility of the introduction of air, *while the aperture that has been left has been so minute that no blood has flowed, and it has immediately closed* on the withdrawal of the instrument.

In that paper, I gave the details of eight cases. The *prominent* points of these cases may be seen in the tabular statement in this communication. The results to which I arrived, from my previous thought on the subject, and from the examination of the cases, may be best expressed by the following extract from the preface: "My own mind is decided upon the following propositions: I shall puncture the chest; *first*—whenever, either in an acute or chronic case, I find a pleural cavity *distended* or *filled* with fluid; *second*—whenever, in any *acute* case, remedies seem to have but little effect towards causing an absorption of the fluid, and after a fair trial has been made of them for two, three, or four weeks; *third*—I shall puncture in cases of larger effusion, complicated with organic disease, in the hope of relieving urgent dyspnœa or to lengthen life."

Upon these principles I have acted since they were laid down. The only change I should make in them, at the present time, with the experience of the results of twenty-nine punctures made in the sixteen new cases is this, viz. I would not wait so long as "three or four weeks" in acute attacks, provided I found that the effusion continued steadily to augment in spite of remedies. Moreover, if called in an acute case that has lasted a month, and in which there is an amount of fluid effused, sufficient to materially compress the lung, I shall advise a puncture, as the *first* step to be taken, previously to the use of the remedies commonly employed in pleuritic effusions. I trust that the result to which I have arrived from *seeing* the patients, may not be different from that to which the reader will arrive from the *perusal* of the following cases.

They are given in the chronological order of the operations, but they, with those in the preceding paper, may be classed in four main divisions, according to the effect of the operation:—

First Class, or those cases in which the operation has been the chief or sole cause of the cure of the pleuritic effusion. Cases* 1, 7, 8, 11, 12, 14, 15, 18, 20, 21 (total, 10), are of this class.

Second Class, or those cases in which the puncture has given more or less, and at times very great, temporary relief, so that some of the patients have asked for the operation a second, third, or fourth time, for the sole ob-

* See tabular statement.

ject of getting relief. Cases 2, 3, 4, 9, 10, 13, 16, 17, 19 (total, 9), are of this class.

Third Class, or those in which no relief was obtained, because no fluid could be removed. Cases 5, 6, and 25 (total, 3), are of this class.

Fourth Class, or those still under treatment, which are progressing favorably, with more or less rapidity. Cases 22, 23, 24 (total, 3), are of this class.

Cases.

Case 9th.—Mr. G., æt. about 20, clerk. I saw him with a physician of this city, Oct. 17th, 1851. During the winter of 1850–1, he had had some pulmonary trouble; but the patient assured me he had been well from that time until the actual attack for consultation upon which I had been called, and which proved to be one of very latent pleurisy of two or three weeks' standing. He had had no pain or dyspnœa, and only a slight cough, for ten days or more. He was able to be at work, but felt not quite well. On examination, I found signs of effusion into the chest. They had been recognised by the attending physician. I advised blisters and iodide of potassium. This treatment was continued until Nov. 6th, but with a gradual increase of all the symptoms. On that day, there was perfect flatness of the lower third of the right back, the sound changing by change of posture; a peculiar stomachic resonance above the line of flatness; ægophony; on succussion, some gurgling, but no metallic tinkling. The respiratory murmur was slight, even at the apex of the lung; but no râle was heard even on coughing. His general symptoms were improved. He was able to walk about, although some dyspnœa was evident. Pulse 100; skin comfortable, slight sweat at night. As the iodide had not been thoroughly tried, and as there was an indisposition to the puncturing of the chest, on the part of the attending physician, I advised 5 grs. 3 times daily, and blistering to be continued, and certainly not to allow a much longer time to elapse before doing the operation.

Nov. 22d. He was suddenly seized with pain in his other side, with great dyspnœa and anxiety. He had, however, obtained relief from a poultice and Dover's powder before I saw him. The auscultatory phenomena were as before, except that there was dulness to the second rib in front; there was no evidence of serious trouble in the left back, the murmur being heard pure everywhere, even to the base of the lung.

I urged a puncture; and on the 24th one was made, between the 9th and 10th ribs, below the angle of the scapula. Nine ounces of yellow serum flowed readily, and afterwards not a drop could be drawn, notwithstanding I passed a probe through the canula and found it perfectly pervious. Convinced that more fluid remained, I withdrew the instrument, and introduced it under the axilla, one or two ribs above; and eighteen ounces

more, of a similar fluid, came freely. The chest became somewhat resonant to the point of the puncture, and the ægophony was heard only at the lowest part. The patient suffered not at all, except that a cough came on which was rather troublesome. Dover's powder and absolute rest were ordered.

Dec. 2d. Had been improving; no returns of dyspnœa; patient felt brighter; he was able to lie on either side; pulse 108 to 112. On percussion, was really flat only in the lower two inches of the back. Respiration heard, vesicular though indistinct, along the vertebral column to near the base of the chest. Blister twice weekly, (3x3.)

Dec. 13th. Better in strength and appearance. His digestion was good. Pulse about 100, and occasionally a slight flush, P. M., and a little sweating at night. Respiration less labored than formerly. On inspection, the right side was evidently the larger. Murmur heard through the whole back, though indistinctly, to a line at the edge of the axilla; bronchial towards the base; absent on the side, under the axilla, and on the breast. No râle, but a metallic echo was heard on coughing. Good pulmonic sound, on percussion, on the back to where the bronchial respiration was heard. There it was *stomachic;* dull below the line of the nipple, front and side. As the patient was annoyed by the sound of liquid, and as he thought he had breathed less easily for a day or more, he desired to be operated on. I accordingly punctured, and drew off eighteen ounces of an *amber*-like fluid. After the operation, the bronchial respiration and the stomachic resonance were much lessened. Cough again supervened, as at the previous operation; the pulse was slightly accelerated, but the patient was not at all fatigued. Continue medicine. Tinct. of iodine to the side.

Jan. 14, 1853. The patient had continued without much change. He *felt* well—walked down stairs; was able to lie on either side. The pulse, however, was always accelerated—often 120. Auscultatory phenomena, however, revealed a similar state to last report. I drew off twenty-one ounces, more purulent.

Feb. 9th. A similar condition of the patient, except that he was rather improving; he had no hectics; he had gained flesh. I drew off again twenty-one ounces of a fluid still more purulent, and running but slowly.—Cod-liver oil. Ride out daily.

March 9th. Looked finely; able to walk out freely. Cough, very much less. Only slight dyspnœa. No gurgling heard since last operation. Dulness, much as before. Respiratory murmur heard further out on the side. I operated between the 5th and 6th ribs, and further forward, toward the nipple. Two pints of freely running fluid were removed. Patient was much more able to assist himself than after either of the previous operations. He had less cough, but a sense of stricture across the chest. Cod-liver oil and phosphate of lime ordered.

Two days after this operation the patient went into Boston to a convivial meeting, and after spending the day, drove out some miles. The weather was excessively cold, and he was very severely chilled. A febrile paroxysm supervened; and the pulse rose to 120, and a general feeling of distress, especially of limbs, was experienced. On the 17th there appeared what seemed to be a general inflammatory condition of the absorbents; small red lines were seen running along the legs and arms; quite tender to pressure. No trace of inflammation on trunk—and the point of puncture was perfectly healed. Patient had an anxious, sublivid look. The attending physician had used alcoholic lotions and 12 grs. of iodide of potassium. Meanwhile, the physical signs, though similar to what was noticed before, were rather more favorable.

He recovered from this acute attack in a few days, but he never was as well again; and, in about five or six weeks, signs of tubercular developments showed themselves in the diseased side—marked by crackling, and, subsequently, pectoriloquy at the apex.

Owing to illness, I did not see him afterwards; but in May, as there were signs of pointing, the attending physician opened with a lancet, and pus continued afterwards to flow, till he died suddenly, in the night of August 7, without warning, in consequence of copious hæmorrhage from the aperture. He had been, however, gradually declining for months. His physician writes, "Life had been despaired of from day to day; and, previously to the hæmorrhage, he had coughed very hard. The opening in the side did not become fistulous, in the true sense of that term, for it showed a disposition to heal from time to time, so as to render necessary the introduction of a tent. Injections of a watery solution of gum myrrh had been used every other day for some time before his death, whereby the patient was comforted, the discharge was lessened and made less offensive."

Reflections.—I had no doubt, when I was first called, that the case was one of *pleuritic effusion* of the most latent kind. But I feared, from the fact of even a trivial cough having existed before, that it was of a tubercular origin. I felt the importance of an early removal of the fluid; yet the small amount of it, and the slightness of the symptoms, connected with the fact that medical opinion was adverse to thoracentesis, prevented me from suggesting the operation at my first visit, Oct. 17. At my second, twenty days afterwards, I submitted the idea to the attending physician; but as the same reasons existed, the operation could not be performed, although the fluid had increased. Finally, the sudden attack of dyspnœa, on Nov. 22, a little more than six weeks from his attack, led all parties to feel that more active measures should be used. As I view the case now, in the broad light of ulterior experience, I think the delay was probably pernicious, possibly fatal; for, although in our present knowledge of the subject, we cannot be

sure that an early operation will prevent the tendency to tubercular development, the fact that whenever any amount of fluid is drawn off, the *rational* signs almost invariably improve, and the examples we have of the excellent results of an *early* operation in cases of pleurisy evidently tuberculous in their origin—these facts prove, almost conclusively to my own mind, that *it is better always to operate as early as possible in any case in which there is any considerable amount of fluid, especially in one of a tuberculous tendency.*

In regard to the other interesting points in this history, I would state that the patient always experienced so much relief from the operation, that he was sure to be the first to ask for its repetition. It may be remarked, also, that he had no alarming return of dyspnœa, subsequently to the first operation.

The last topic, specially suggested by this case, is the violent hæmorrhage, causing death. It will be remembered that this took place at least three months after the opening by the lancet, and six months from the last puncture. I have seen a similar case, under the care of another, in which exactly similar phenomena occurred, except that the case was one of pure empyema, punctured after months of illness, and again opened with the lancet when pointing. After the second opening, the patient improved very much, but a fistulous passage remained. From this occurred a hæmorrhage, which was repeated to an alarming degree a few days after. The patient was becoming anæmic. A surgeon was called, who enlarged the opening; could find no vessel, but a bleeding granulating surface. The aperture into the thorax being fully dilated, the patient had no more hæmorrhage, and slowly recovered. The question may be asked, if the puncture had any connection with this state of things. My own opinion is, that there is no proof of their connection. On the contrary, the facts as they stand are decidedly opposed to the idea of such a connection. I speak of it, however, in order that all circumstances may be known that seem, even remotely, to be favorable or otherwise to the operation, as urged in this paper.

Case 10th.—Mr. T., æt. 30, a rigger, I saw Feb. 17, 1852. It appeared that, for a year before, he had had cough; but that, during the summer, it had been slight, so that he kept at work until Dec. 18th, 1851. He then had sharp pains in the right side of the thorax, for which venesection was performed. He kept his bed, at that time, for a week; and then, feeling better, went out, daily, for a fortnight. He then became more ill, and he had been confined to the house for five or six weeks previously to my visit. Hectics for the same length of time. His appetite, from the first, had been poor, but his digestion good; tongue red, and with a slight coat; dyspnœa

always from Dec. 18th; at times orthopnœa; expectoration considerable, opaque. Pulse 124, skin warm and moist. His countenance was haggard and distressed; he was sitting up, from inability to assume a recumbent posture. On percussion, flat below the third rib, front and behind—not clear above. Respiratory murmur obscure to third rib, indistinctly bronchial below, with a metallic tinkling on coughing or shaking. Behind, similar results, and ægophony. At the left apex, some rudeness of murmur. Right side of chest moved, during respiration, less than the left; intercostal spaces *contracted*. Diagnosis—tubercles and pneumo-hydrothorax. I advised a puncture for *relief* to the suffering; but as the patient was unwilling to submit, I ordered iodide of potassium, 3 grs. three times a day, and a blister every fifth day.

Feb. 27, i. e. ten days afterwards, much more dyspnœa—no relief. Patient then consented to the puncture. I made it in the usual space, between the eighth and ninth ribs, and drew out a little purulent fluid with much difficulty. I then punctured two ribs above, and two inches further forward, and removed ℥ xv. with very little pain and much relief to the distress of the patient.

March 3. For a day, the relief continued, but soon the dyspnœa began to return; cough constant; strength less. At my visit of that date, he had complete orthopnœa, and was in great agony. I told him I would do as he chose. I had little hope of giving, by any puncture, more than a temporary relief to his sufferings. From his previous experience, he requested me to operate. I punctured at the lowest point, and drew off ℥iii. of a purulent fluid; and on puncturing above, I procured *nothing*. The patient felt no uneasiness, except that after the operation, he, having lowered his arm, struck the canula, and caused much pain by its motion between the ribs. The next day, there was some redness and tenderness at the point, which subsided under a hop fomentation. The patient died on the 8th. No autopsy was allowed.

I present this case simply as a specimen of the relief obtained in a hopeless disease. This relief was more evident to the patient than appears from my record. The fact, however, that a request was made by himself for a second operation, is a proof of the little real suffering sustained, and the relief procured. The inflammation after the fourth puncture, though slight, was more than I ever noticed before; and was, doubtless, owing to the striking of the canula while in the wound. Its rapid subsidence, however, especially when connected with the ordinary absence of all symptoms of the kind, is not unfavorable to the operation.

Case 11*th*.—Mr. R., æt. 59; "An old soldier," wounded at Waterloo; in U. S. 23 years, where he had had numerous occupations, and had

indulged in free living. He was "well," till his disease began, for which he entered my service at the hospital. About five weeks before his entrance, he had had pain over the left crista ilii, and in a few days had hæmaturia, with dysuria.. Appetite lessened; very costive; some slight dyspnœa; cough very seldom. Very little treatment previously to entrance. At his entrance, he could lie easiest on the right side; but he had been, however, able to lie on either. He sat up, and could talk, but with evident dyspnœa. Respiration, 17; pulse, 96; skin, normal; tongue, moist, with a thin white coat. On inspection, intercostal spaces filled in the lower half of the left chest. Percussion, flat all around the same side, below a line on a level with the second rib. Murmur scarcely perceptible throughout. Puerile at right, with slight, fine crepitus at the base. Ægophony over dull space. Heart beating to the right of the sternum. I ordered inf. sennæ comp. f. ℥ iii. with cathartic enema; broth for dinner; house diet at other meals.

Dec. 29, I punctured between the eighth and ninth ribs, behind, and drew off ℥ xxiii. of a yellow serum, with relief to a sense of fulness there, and with more ability to lie on the right side. Pulse, a short time after operation, was 98. Ordered iodide of potassium, gr. iii., three times daily, in syrup of sarsaparilla. Blister (3×3) to left side. He had an opiate given at night.

Dec. 30. Much lighter since operation; less cough, and not painful; urine much increased. Blister very troublesome.

He soon after left the ward, and consequently fell under the care of my colleague, Dr. Bigelow. His subsequent history is as follows. Sol. magnes. sulph. was given several times before the 11th of February. Afterwards he drank freely of cream of tartar. Under these remedies, his bowels were freely opened, so that, at one time, the cream of tartar was suspended.

Jan. 2 (four days after the operation), his chest was flat in the lower two-thirds of the back; bronchial respiration and ægophony there. Obscure respiration in the left breast.

Feb. 1. Friction sound at the lower part of the left breast. On 15th it was much stronger. But Feb. 1st, he had some cephalic symptoms; cephalalgia, scintillations, &c. Nausea and vomiting on 8th. Pulse quickened. On 18th, some wandering of mind. 21st, twitching of muscles, and insensibility. On 22d, he died comatose.

Feb. 24, autopsy by Dr. J. B. S. Jackson. The records of the chest are as follows, "Left pleura mostly quite free; strong old adhesions over apex only, and along the lower lobe near the spine. A few ounces of turbid, serous fluid only in the cavity; nothing like pus. A delicate film of false membrane was seen over most of the pleural surface, just enough to obscure its *polish* for the most part; in some parts ⅛ or ½ an inch thick, translucent, organizing. Left lung small, but more or less air everywhere in it. Consider-

able congestion; weight ℥ xiii., length 10 inches. Right lung, everywhere old pleural adhesions; lung itself healthy, but congested. Stomach, extensive cadaveric softening of mucous membrane of left extremity. Kidneys healthy, except for a simple serous cyst, the size of a nutmeg. Prostate generally enlarged. Lobe stands out directly into the bladder, size of a marble, and round. *Head* acute meningitis at base, not very extensive. Pia mater there, red, flabby, and rough, but no decided granulations. Convolutions flattened, and surface dryish. Lateral ventricles contained ℥ v. of serum, with softening of the surrounding substance."

Remarks.—The totally latent character of this attack; the prominent symptoms (hæmaturia, &c.), in fact, leading the physician to suspect nephritis rather than pleurisy; the easy diagnosis by means of the physical signs; all these are facts of importance.

As to the advantage derived from the operation, no one, I think, will doubt about it, who remembers the improvement in the rational and physical signs; and, above all, the appearances at the autopsy. A very little fluid was found in the pleura; the membrane was inflamed only in the slightest degree; the patient evidently had died of his acute meningitis, while recovering from his pleurisy, which recovery commenced with the time of the puncture of the chest.

Case 12th.—Mrs. S., æt. 21, I saw with a physician of Boston, Feb. 27, 1852. The antecedents of her actual condition were somewhat vaguely obtained, owing to the sufferings of the patient. It appeared, however, that she had had a cough during the autumn, and that, about six weeks before I was called in consultation, she had what was called pneumonia (? pleuro-pneumonia, or, more probably, pleurisy), with severe pain in the right side. From the more serious symptoms caused by this, she had recovered in about two weeks, and she was able to walk about, though she was weak. She soon became ill again, and with evident signs of pleuritic effusion. She had had hectic paroxysms. Menorrhagia she had been subject to till two months before, and since that, amenorrhœa. At our visit, she appeared in great suffering with dyspnœa, pain and discomfort in the side. Her previous night had been very bad. Her countenance was pallid and haggard; her pulse was 108.

The physical signs were, flatness over the whole of the right chest; strong tubular respiration to the third rib; with great vocal resonance. Ægophony at the back and side, below the middle of the scapula. Puerile respiration in the other lung. No râle anywhere. The right side of the chest was very prominent, and at one spot, it was very tender; and as it had given evidence of fluctuation, an escharotic had been applied some days

previously, but the eschar had not separated. The intercostal spaces were *more contracted* than usual.

I punctured at the usual spot (viz. below the angle of the scapula and between ninth and tenth ribs), i. e. about five or six inches from the spot that was pointing, and ℥ xli. of very thick pus were slowly drawn out, without any difficulty, save at one time a slight stricture across the chest. The prominence described above, subsided at least one-half, and some resonance was heard, on percussion, down to the line of the puncture. The cavernous voice in front, and the ægophony behind, were nearly gone; while the bronchial respiration in front was very much lessened. The whole aspect of the patient was wonderfully improved. She smiled, and felt much relieved. Pulse 96; hand cool, damp; asked for food. Ordered iodid. potass. ℈i., syrup sarsaparilla ℥ iv., ℈i. three times daily. Eat meat, and drink ale cautiously.

29. Night very comfortable; much less oppression and soreness of chest; but the part cauterised had risen again, was puffy and crackled from air in it. Similar crackling felt in the cellular membrane above, on the parietes, as high as the second rib. On percussion, good resonance to the point punctured—dull below. Cavernous respiration and ægophony wholly gone; and in their place was a want of respiratory murmur in the back, and metallic tinkling in front.

March 3. Much better; appetite sharp; bowels costive; no night sweats; pulse 90; chest, less prominent; eschar removed. Physical signs as before, except more vesicular respiration to the angle of the scapula, and across a space of three inches broad from the vertebral column. Rochelle.

March 9. On 4th, the abscess broke where the eschar had been made, and discharged, after a violent cough, an immense quantity of pus, so that the mattress was thoroughly soaked. Relief was obtained, and the discharge continued until 8th; some cough; slight expectoration. Physical signs—crackling, whole of the front of the chest (evidently from the lung expanding). Metallic resonance gone. Percussion very much better behind, and the respiratory murmur was heard even out to the axilla. Continue treatment.

March 13. Steady improvement; digestion perfect; slept well; no fever; sat up an hour yesterday; I learned that a new discharge from the same point had occurred, copious, and that from that time it had been more or less constant. At the visit it ran freely; cough very light; able to lie on either side; pulse 110. Respiratory murmur a little more, but much as at previous visit. Slight ægophony, at the very base of the chest; side still motionless; some emphysema still, but less in front.

Subsequently I did not see her; she went into Maine in August, was feeble at the time. After a few weeks residence there, she returned to East

Boston in September, when the fistulous opening closed entirely. From that time she has gained perfect health. Now (Nov. 18, 1853) she feels better than for years before her illness. She has no cough, except occasionally on taking cold. She is a stout, able-bodied woman. Her side is but little altered in form. Through her clothing, the change is not perceptible; but the dressmakers perceive that the left side is the larger. The respiratory murmur is vesicular everywhere, but less throughout the right, especially in the lower part of the lower lobe, where it is scarcely perceptible.

Remarks.—The puncture in this case gave the most gratifying relief; and, although the pleura opened in a few days, the patient looks back upon the operation as having given her the first step towards recovery. She never suffered afterwards as she had suffered before. Could not relief have been obtained earlier? Undoubtedly, such might have been the fact; and the reason why the operation was not performed was the general unwillingness, at that time, on the part of the profession, to believe in the advantage to be derived from it. The same reason allows, at the present time, hundreds to be suffering from the same cause, in various parts of our country. May I hope that this paper will tend to the alleviation of their sufferings?

Case 13.—Mr. B——, aged 40, Irish laborer, I saw with Dr. E——, Dec. 30, 1852. Generally well; two years ago, some dysenteric symptoms for eight weeks. Well afterwards till July; then slight dry cough; on 14th, fell, and struck his left side upon some stones. He had pain in the side ever afterwards, and although he was able to be out of doors, he did but little hard work. Shortly after his fall, he was exposed in the night to a drenching rain, and was thoroughly wet. He had a bad chill, and the pain was much increased. He was then treated by a physician, and got better again; but about six weeks afterwards, while pushing a raft, he fell into the water, and was obliged to walk some miles with his wet clothes upon him. After that period he had done no work, but till within nine weeks he had occasionally gone out of doors. During these nine weeks, he had been confined to the house with a gradual aggravation of all his symptoms. During the three weeks preceding my visit, he had heard "a splashing" in the chest. His cough had been at times very hard. His expectoration had been slight, never bloody, generally white and frothy. He was unable to sleep on the right side, although he could lie a short time upon it. Tongue smooth; appetite poor; bowels well. He panted very much, and was in great distress. He was seated, moaning, on the bedside, with his head bent forward; respirations from 48 to 52 per minute; pulse, 96; skin of natural warmth; urine sufficient, and by report of patient was natural. Little motion of the left side of the thorax; on succussion and coughing there was a sound of fluid and of

air in the chest. The left chest was dull over a large space, dulness varying with the change of posture of the patient. Metallic echo heard in the breast on coughing; heart pushed strongly to the right of the sternum; lower part of the left chest rather prominent, quite tender, soft, but no evident pointing.

A puncture was made between the eighth and ninth ribs; great relief followed. In fourteen minutes I had drawn out ℥ lxiv of a purulent fluid. Cough came on then as the sole unpleasant symptom during the operation. The heart fell back a little. Tincture of Iodine externally, and Iodide of Potassium internally, were ordered as in the other cases.

Jan. 3. His nights had been much easier; less cough. No moaning, and whole aspect much improved; appetite poor; pulse 96; had kept in bed all the time; urine as before operation; some tenderness, low down on the left back, but more particularly near the point of the puncture. The respiratory murmur seemed a little more evident at the apex of the lung. Otherwise, the signs remained as before the operation.

Jan. 10. The tenderness and peculiar prominence of the back had subsided; the respiratory murmur was heard indistinctly along the vertebræ, and some resonance to about an inch above the point of puncture; otherwise, physical signs as before; patient had become more feeble, and had had more dyspnœa for a few days, and lay, moaning, at my visit. Desired a second puncture as a relief, though he had no hope of a cure.

Jan. 11. I operated a second time, and in 46 minutes removed ℥clxxv of thick pus; previously to the operation, the left side was 2⅞ inches larger than the right; afterwards it was only 1¼. Strong metallic tinkling was heard everywhere front and back. The operation was borne very well, and afforded vast relief; the patient sat up on the side of the bed, with much less dyspnœa, and chatted with his friends. He was advised to enter the hospital, but he died within forty-eight hours, having accidentally taken an overdose of opium. No autopsy was allowed.

Remarks.—Let it be remembered that this patient had been ill more than five months with a pleuritic effusion. When I saw him, he had orthopnœa, great emaciation, and all the marks of approaching death, unless relief were obtained. I conceived it right and best to operate, but I did so with little hope of doing permanent good. There was a *chance* of permanent relief, and almost positive certainty of temporary relief from agonizing distress, and by an operation, as I believed, perfectly innocuous. The results, as far as they went, were satisfactory. He obtained so much relief from the first puncture, that he eagerly sought for a second, when I drew off the largest quantity of fluid, and that likewise being pure pus, I had ever extracted, viz., about 5½ quarts, which, added to the two quarts previously taken, made about 7½ quarts in twelve days.

Case 14.—March 19, 1853. Saw with Dr. —— of Roxbury, Mr. ——, age 24, clerk. I learned that he had lost a brother and sister by phthisis; he had a cough seven years before, and slight hæmoptysis; he went to Cuba, and returned well, and had been in active work since, with only an occasional cough; two years ago he had a slight pain in the right side, and could not, for a time, easily straighten himself; a fortnight before I saw him he weighed 162 pounds, and felt in perfect health. On 8th, he went to his warehouse as usual, and, P. M., he had chills, a slight cough, and a very few sputa; he returned home, and did not leave the house afterwards. In two days a stricture came on in the chest, which gradually augmented from day to day; no marked fever; his sleep had gradually become more and more disturbed, and finally he was unable to lie on the left side; he sat up most of the day; his appetite was lessened. Dr. —— had discovered, early in the disease, an insidious attack of pleurisy; and the effusion had rapidly progressed until the time of my visit, while the patient had been daily getting worse in his general symptoms. I found him sitting up, rather pale, and thin; no great dyspnœa, but some labored breathing while talking; pulse 120, small and irritable. The right side of the chest was larger than the left, and felt solid on percussion. Flat percussion, except at the very apex, behind; absence of respiration in the same space; slight crackling on cough, at the left; ægophony all over back, below the spine of the scapula. Diagnosis: very large effusion, probably tubercular.

On 20th I punctured in the usual place, and removed three pints of a yellow serum; severe stricture across chest, and coolness of surface, with weakness of pulse and debility supervened. Wine and water. Iodide Potassium grs.iij in infusion digitalis, three times daily. Series of blisters to the side.

22d. Much relief; had slept better, more appetite, urine augmented; looked better; stricture in chest gone, Pulse 96; could lie down easily on either side. Percussion clearer, even down to the point of puncture behind and to the third rib in front. Respiratory murmur heard indistinctly to the same parts. Less crackling at the apex. Ægophony gone, except in lower two or three inches. No inflammation about the point punctured.

From the time of the operation, the rational signs improved; so much so, that without the physical signs to guide us, we should have considered him as getting well quite fast. The treatment was continued. The physical signs however indicated that the lung did not readily expand in its entire mass. On April 30th, I reported the physical signs as follows:—Decided contraction of the right chest; scapula projecting. Resonance better to the base of the lung. Respiration heard all over chest, but obscure and occasionally with a click or rubbing sound. Bronchophony, which had been marked from the first at the right apex, was less. No râle there, even on coughing.

Nov. 12. To-day I saw this patient, he had been travelling and riding

on horseback, and using cod-liver oil during most of the summer. He had partially resumed business during the previous six weeks. He looked healthy; felt as well as he ever did in his life, except that he had dyspnœa on running up stairs, which subsided easily after rest. His digestion was better than for months before illness. He had no cough, nor any appearance of hectics. He had gained flesh. Once, he had an attack of asthmatic wheezing, a distinct paroxysm of asthma lasting about two days, during which, by the account of his physician, he had sonorous râles throughout the left or healthy lung. I auscultcd him, and found some dulness on percussion of the lower half of the right back and under the axilla to nipple; less sound generally on that lung. Respiratory murmur almost null in the lower third, and obscure but healthy in upper parts. Voice scarcely heard at all in the lower third—not especially morbid anywhere. Left lung well. Patient regards the operation as the first step towards his present relief. He had been steadily growing worse until the puncture, and he has been as steadily, though slowly, growing better since. I presume that during life there will always remain some physical signs; for I presume that the lower part of the lung is in the condition described by Dr. Gairdner* of Edinburgh, as occurring after pleurisy, bronchitis, &c. The vesicles cannot and probably never will fully expand.

Case 15.—June 10th, 1853. Mrs. B——, I saw at E. Boston, with Dr. ——; æt. 45. She was the mother of a large family, which she had usually superintended until her illness; but she had been considered tuberculous, and for months had used cod-liver oil, under which, previously to her actual attack, she had been tolerably well. For three months before I saw her, she had felt not quite so well. Six weeks previously, she had had an acute pain in the right side; but it did not prevent her from going about the house. Three weeks before the operation, she went to church all day. While dressing for this purpose, she was surprised to find that her gown was too tight, and she had some dyspnœa. She, however, continued at work for a few days, when, owing to an increase of the symptoms, she was compelled to desist; she lost her appetite; the cough became dry and hard; the dyspnœa was extreme, so that at length she could not get up into her chamber, and fits of suffocation occurred, threatening death.

I found her with an anxious, very livid countenance, in bed, half erect, pulse 115. Respiration much labored. On percussion, the right side was flat everywhere, except at the apex behind. Respiration scarcely heard, even under the clavicle; bronchial for a small space along the vertebræ from top to bottom, absent elsewhere. Puerile through the whole of the left.

* British and Foreign Med. Chirurg. Rev., April 1853, Art. XI.

I punctured between the 8th and 9th ribs behind, and drew eighty-three and three-fourths ounces of yellow serum. The patient experienced the greatest possible relief, and suffered scarcely at all, except at the last of the operation she had some stricture across the chest and the cough was a little troublesome. The sounds on percussion *instantly* became more clear, to the point of puncture. The bronchial respiration was replaced by the vesicular. Crackling was heard throughout the right breast, evidently from the expanding lung. The pulse fell to 108, and she was able to lie on the left side, in a position which nearly suffocated her only twenty minutes before the operation. She was allowed broth and wine. During the next twenty-four hours, she coughed much and raised nearly a quart of frothy, white fluid.

I saw her, P. M., June 11, and found her quiet, with much more easy breathing; she was much less livid; she relished her broth and wine.

From this time, she steadily progressed, the lung expanded rapidly, as marked by râles that were heard everywhere in it. The little fluid that remained in the pleural cavity was soon absorbed; the urine was much increased. The œdema of the legs, that existed before the operation, was wholly gone by 20th (10 days after operation); the lividity of the skin had subsided. The appetite and digestive functions improved, and were excellent at the above date; no dyspnœa; pulse 84, quiet; little cough; only felt weak. On percussion (20th), 10th day from puncture, there was only a difference of pitch between the two sides—no real dulness. Vesicular murmur was heard in every part, only a little less at the right than at the left, with a dry crackle at the top on coughing.

Sept. 23. I found she had been going on well, though she was still feeble; scarcely any cough; digestion excellent; slight feeling as of pain or obstruction in the right side on full breath; was able to superintend her domestic affairs; she visited me at my office. On percussion, less sound at the *left* than the *right* top, and the voice was more resonant there; and I thought I heard, at times on coughing, a slight crackle there. Murmur obscure at the right apex. *Equal and clear in both lower lobes.* In other words, the signs were those of the chronic previous disease, the acute pleurisy having left little or no traces of its existence. Ordered to resume cod-liver oil.

This case I deem of especial importance:—1st. It indicates that a suspicion of tubercular disease of the lung must not prevent us from operating. This, with No. 7, proves the truth of this assertion. 2nd. I believe the operation saved human life. The patient was livid, and looked almost suffocating. Twenty minutes before the puncture she had, in fact, nearly expired. Twenty minutes after, she was like one restored to existence, and yet no operation of severity had been performed on her. 3d. The intensity of the cough was in exact proportion to the rapid unfolding

of the lung.* In 10 days, and probably before that, the lung was in contact, in every part, with the thoracic parietes. Surely, the operation did good service. Is there any possibility of a like result having occurred from the use of the common remedies? I think not.

Case 16.—Mr. H——, entered Mass. Gen. Hospital, May 28, 1853. Irishman, in U. S. 2 years. Sick three months only: he first noticed a cough, which came on after an exposure to wet and cold—no hæmoptysis. He was very ill at his entrance into the hospital, and continued to grow worse, with signs of disease in both cavities of the thorax. Flatness on percussion was observed in the lower part of both backs; the respiration was rude and bronchial at the left; mucous and sonorous râles everywhere. He was supposed to have pleurisy of both sides, and disease of the lungs, probably tuberculous. On 11th of July, the report by Dr. Storer was as follows: "Has been gradually failing during the last week; greater dyspnœa; at each visit bathed in cold sweat; countenance haggard, although he constantly reports himself as comfortable; pulse usually was 120." On this day I operated, at the request of Dr. Storer, between the 9th and 10th ribs, and drew off twenty-three ounces of highly-colored serum. On the subsequent day the record was—"Comfortable day and night; respiration less labored; pulse 110; countenance more tranquil." He continued improving until 17th, when the dyspnœa was augmented. He afterwards grew worse; and Aug. 5th, I punctured anew, and drew off thirteen ounces of colored serum. Little relief ensued, and he soon after left the hospital to die.

Reflections.—The peculiar nature of the fluid is the most interesting feature of this case. No. 3 presented the same fluid, and with similar result. I would draw the attention to the late date and the severity of the symptoms before the operation was allowed, but he obtained so much relief from the first operation that he gladly submitted to the second.

Case 17.—July 18, 1853. I operated on a young child, 6 or 7 years old, who had been operated upon several times by Dr. Wyman, of Cambridge, and who fell under my charge in the absence of Dr. W. in Europe. I removed twelve ounces of pus with ease, and with some relief to the patient. He has, however, died since.

Case 18.—July 18, 1853. Saw J. B——, with Dr. W——, of Jamaica Plains. Æt. 19. Clerk, from a city in one of the extreme Southern States.

* This fact fully sustains the view of Valleix, and as certainly is opposed to that held by Barth, upon the cause of the cough after thoracentesis. See, in Appendix, the analysis of an article on thoracentesis recently (Oct. 1853) published in the *Archives Générales de Médecine.*

It appeared that he had been ill from December, when he had "fever" and some cough, and obscure symptoms. From these he slowly recovered in two months, and resumed his work. He, however, was never wholly well, and in the spring he came north to recruit. At New York, he was seized with what was called "fever," and was ill a few days. Finally, four weeks before I saw him, he arrived at Roxbury. He was then not well, but he was able to walk about. On the evening of July 4th, he was exposed upon the Common, while viewing the fire-works. From that moment, he became rapidly worse, with debility, emaciation, total loss of appetite, febrile paroxysms every P.M., a very slight, scarcely noticeable cough; no expectoration; no evident dyspnœa, even on going up stairs. He could lie as well on one side as the other, and move rapidly from one to the other, without the least apparent difficulty of respiration.

At my visit, I found him a frail-looking youth, evidently much emaciated; he was reclining on a sofa, and without any marked symptom. His breathing, during conversation, was only a very little labored. His pulse usually about 80, was rapid, apparently from emotion of mind. Only two days before, auscultation had been performed, and flatness of the whole of the right side of the chest, even to the apex, was found. There was bronchial respiration in the breast, and absence of murmur elsewhere. No ægophony. Fulness and want of motion of the intercostal spaces.

July 19th. I punctured in the usual spot. More than eighty ounces of yellow serum were drawn off, without the least trouble to patient. From this moment may be dated the commencement of the perfect cure of the disease from which he had suffered so many months.

On 20th I found him in every respect better—stronger, appetite better; less fever; sleep easier; respiration not heard outside of the axilla, but heard indistinctly along the vertebræ to the base of the back. Friction sound to 4th rib in front. Iodide of potassium internally, and iodine tincture externally, were used as in the previous cases.

26th. Murmur pure to nipple; obscure in the lower half, and generally in the back. All general symptoms better. Countenance much improved.

30th. He had ridden out freely, and had gained strength daily; had eaten full diet, and his digestion had been excellent; had gained flesh. Rubbing sound heard on the back, down to the point of puncture. Percussion equal in both backs, to the same point.

August 15. Fat and rosy, able to walk, ride, and eat as he pleases He felt well, better than since his first attack in December. Murmur heard to the base of the right lung, without râle or friction sound. Percussion nearly like other side. Continue remedies.

Aug. 26. Saw him at my room. Weighed more than is usual, when

in health. All rational and physical signs improved. Only the slightest difference perceptible, on auscultation, between the two lungs.

Reflections.—Surely nothing can be more significant of cause and effect than the immediate commencement of recovery from long illness, after the operation. The record gives but a faint idea of the sudden, elastic bound with which every function of the body leaped into healthy action, the moment the incubus, which had been for months depressing them, was removed. On the following day the appetite was keen, the strength augmented; the urine, scanty before, flowed freely; the nights became easier; and the mental condition, as evinced by his countenance, showed that a great load had been removed.

The case is deeply interesting in other respects. The length of time it had continued latent was thoroughly peculiar. I do not believe, however, that he had had as much fluid as I removed, ever since his first attack in December, that is, for six months. Probably it had accumulated gradually at New Orleans, Staten Island, and Boston. I have never seen a case in which so much fluid existed with so little dyspnœa. A moment before the operation I made the patient turn rapidly from side to side on his couch, which he did without the least apparent dyspnœa. Not a single untoward symptom arose after the puncture, but everything tended towards restored health. On the 11th day he rode out, had gained flesh, &c. On 27th, he was, as he thought, in perfect health, and the respiratory murmur was heard to the base of the lung, while percussion gave almost equal results in both backs,—and this, too, after months of illness.

Case 19.—July 30, 1853. Mrs. L., I saw at Weymouth, in consultation. Æt. 20. Two years before, she had been married, and had been nursing till a few months previous to my visit. Her strength had been much prostrated. A cough, with pain in the right side of the chest, came on in February, but she thought little of it. The pain having subsided under a blister, she kept at her household employments, though not entirely well.—Gradually, however, the nursing and the local trouble overcame her, and she had been obliged to give up nursing, and to be confined to her house for three months, with evident disease of the same side. The debility had become greater, and she had taken to her bed. The symptoms were pains, never very severe, in the right side; no, or but very slight, expectoration, never hæmoptysis. Coughed less for two weeks before my visit than two weeks previous; but the cough was severe if she lay on her left side. Her appetite had been almost wholly gone for months. Urine normal in quantity and color. Occasionally, she had had a chill, but no marked hectics.

I found her lying in bed, emaciated to the last degree, and evidently approaching her end, unless some relief could be obtained. The right side

of the chest was dull to the 2d rib; flat from there downwards in front, and throughout the whole of the back; no motion of that side; general prominence of it. Obscure bronchial respiration was heard generally throughout the lung, with an indistinct broncho-ægophony; no râle, even on coughing. The other lung had puerile respiration throughout.

I advised an operation, as a means of temporary relief, at least. Accordingly, I punctured in the usual spot, and drew off ten ounces of yellow serum, which coagulated on standing. Suddenly, she complained of faintness and great stricture across the chest; she was paler, and evidently much distressed. On the removal of the canula, and putting her upon the bed, all unpleasant symptoms left her. No apparent change in the physical signs.

I advised a tonic course, and a repetition of the operation, if sufficient relief were obtained from that just finished. She passed a comfortable night, and afterwards she was able to lie with ease on her left side, which she had been unable to do for months before. The next day, by report of her physician, the dyspnœa was less. The fluid taken from the chest was nearly all coagulated.

In a few days the swelling of the legs, which had previously subsided after the operation, returned; and, with it, the cough became more urgent, attended with an increase of many of her other symptoms. The patient requested that I should be asked to operate again. Accordingly, on Aug. 3 (five days from her former operation), I examined her anew. The tubular respiration was extreme, and perfectly cavernous throughout the affected side. In truth, it was so marked that I should have hesitated upon the propriety of puncturing, for fear of piercing a solidified or excavated lung. The fact of having found fluid previously, induced me to puncture again. I did so, the patient being in a horizontal position. I could not remove but four ounces of fluid. Some air rushed into the cavity as I was probing the canula. No apparent effect, either then or subsequently, was produced thereby. The patient bore the operation well, fell into a quiet sleep afterwards, and her cough, from that time, ceased to be troublesome. No unpleasant effects followed the puncture; but the patient gradually grew feebler, and died Aug. 13, i. e. on the tenth day from the last operation.

Autopsy hurriedly made at 4, P. M., the same day. A quart of fluid was found in the right pleura, about a pint in the left. The left lung was free and healthy, except one small dot of tubercular disease. The right lung stood out from the vertebræ, solid and firm to the last degree. It was universally tuberculous. The upper lobe consisted of one large, solid, tubercular mass. The pleura was opaque with lymph, and at its upper part was adherent.

Remarks.—The strong cavernous or bronchial respiration, in connection with a fluid, and condensed lung, is an interesting fact, and corresponding

very exactly with observations recently made in Paris. In regard to the advantage of the operation in the case, I have merely to say, that if I were to have a similar case, I should advise the same course. The relief which the patient obtained after the first puncture, in being able to lie easily on the left side, and the total cessation of the severity of the cough, after the second; the fact that the patient begged to have a second operation, because of the relief afforded by the first,—all these convince me of the importance of the operation as a means of *relief*.

Case 20.—August 30, 1853.—Miss ———, of Maine, I saw in Boston. Æt. 23. She had never been very strong, but never seriously ill till present illness; always liable to cough on taking cold, *i.e.* when having coryza. In August, 1852, she had hoarseness, lasting for months and growing worse until December, at which time her strength was very much reduced and she had night sweats. She had slight cough ever after. Never pain in the chest; no tickling or trouble in the throat. Her expectoration had been, at times copious, frothy, and generally white; once she had hæmoptysis, perhaps an ounce, after walking. During February, she was quite ill, and went rarely out of the house. After the 1st of March, she began to ride, and improved rapidly. She also used the cold-water sheet daily. About the 1st of June, after "taking the sheet" more thoroughly than usual, she was seized with a chill and a fever, and a bad cough with great soreness of the chest and shoulder, and orthopnœa. As these symptoms subsided, the cough which she had had before subsided, and she again gained very rapidly. From this attack she had continued somewhat to improve under cod-liver oil, but the left side had always been a little more "sensitive" than the other.

I found her rather thin, but unusually bright and active. She had no apparent dyspnœa, save on exertion, especially after walking up stairs; then it was manifest, though she complained of it but little. She had no hard accesses of cough, but a frequent sense of irritation about the chest, provoking a cough. No expectoration; always some irregular action of the heart, with fluttering at the pit of the stomach, until within the three weeks previous to my seeing her. Tongue, clean; digestion, good. The urine, in June was, for two or three weeks, dark colored and small in quantity; of late, perfectly normal.

On percussion, less sound through the whole of left back than the right; quite flat towards the base. Line of dulness varied with change of posture. No râle, except perhaps, on coughing, at the top of the left lung and just below the angle of the scapula. The respiration was heard in the left breast, but below and under the axilla and in the back it was indistinct.

Ægophony in the lower half of the back. Left side more rounded than the right. The heart beat to the right of the sternum.

P.M. I punctured, and drew off eighteen ounces of a yellow serum, which was all that could be extracted, notwithstanding the patient was placed in various positions. She was nauseated, and vomited her dinner. There was little cough, and her pulse was small and regular, at 80. The heart fell somewhat towards its normal position. The patient stated that she felt as if she needed support, and as if she had "lost half of her side." Treatment as in previous cases, with nourishing diet.

August 31. (i.e. 24 hours after the operation),—could go up and down stairs with much less dyspnœa. The heart was no longer dislocated. There was crackling throughout the lung, even to the base. The night had been rather restless; she could not lie on the left side, owing to a pain in it when so doing; no fever or other trouble; her pulse was 92; she was sitting up and looking finely; her cough was more, but no expectoration.

From this time till September 10th (11 days after the operation), she continued improving. On that day, I noted as follows:—Much stronger; cough only of the most trivial character; some dyspnœa still (but less than before) on walking fast, &c., had walked, however, a mile or more without fatigue. Percussion gave *nearly equally good results in both backs;* but under the axilla and around to the front, near the cardiac region, it was dull. The respiratory murmur was heard throughout the left back, but where there was dulness on percussion the murmur was indistinct, with a crackling on full breath.

September 21. No cough or scarcely any for the past week. Her strength was less and her appetite was not quite so good; some dyspnœa on exertion, but she would be disposed to exert herself much more than her friends deemed prudent. She soon after returned home. I advised her to use the cod-liver oil, and to ride out daily.

October 30. I learned by letter as follows:—"I have been very well since I left Boston, I have had no cough or cold, I am, however, slightly hoarse most of the day." She states, that some dyspnœa remains on walking fast. She had gained a great deal of flesh and strength, so that she could endure much fatigue. I learned from a friend, that our patient seemed to those about her, nearly if not quite well. From the physician in attendance, it appears that the dyspnœa of late has been augmenting.

Remarks.—I regard this case as one probably tuberculous. The attack of pleurisy for which I operated came on in June, the patient having had cough for months before. Phthisis, I think, will probably be the result, but the pleuritic effusion was relieved, as in cases 7 and 15, as evinced by the lung expanding immediately. If the effusion should return, I see no objection to a repetition of the puncture. The chief points of

interest however, are the immediate expansion of the lungs and the sudden improvement in the health, even if it be destined eventually to fail.

Case 21.—Aug. 18, 1853, Mr. ——, æt. 42, generally in active business; and for a time before being taken ill he had been very much occupied, and had been perhaps less strong than usual; for many years he had had some trouble in the right knee; three weeks before he called on me, a cough had commenced which had continued; expectoration slight, in the morning, white; two or three times he had been awakened by pain in his right side; on arising he had at times some dyspnœa, but generally he had attended to his business with comparative ease, although satisfied that he was not wholly well; he was able to lie on either side; he could go up stairs without much dyspnœa; digestion perfect; appetite excellent; some loss of flesh; he had consulted one or two physicians, who had advised trifling external applications which gave no relief; no one had ausculted him.

When he called on me, his countenance was not unhealthy, although his face was rather thin; he walked readily to my room, and seemed to have no dyspnœa; his pulse was 80, and regular; his skin was normal; his tongue was clean. The rational signs denoted nothing of importance; no hereditary predisposition to pulmonary disease. On percussion, there was flatness in the lower two inches of the right back, dulness varying with change of posture. Murmur heard to the bottom, but less than at the other side; no ægophony. Iodide Potassium gr.ii., three times daily, and Tinct. Iodine externally. He was told to use a chiefly vegetable diet, and avoid all undue exposure and over-exertion.

Aug. 20. Less cough, and less oppression; no pain in the right side for three days, though occasionally he had some in the left breast. No fever; and he looked wholly well. On percussion, less dulness at the right back; rubbing sound in *left* breast, and a fine crepitation along cartilages of *left* ribs. Iodine had produced a full effect. Apply it to both breasts.

Sept. 2. General aspect and symptoms same, but the physical signs prove an increased effusion; more dulness, with ægophony, in the right; crepitus less at the left.

Sept. 7. Finding still an increase of the effusion, so as to affect the lower half of the right chest, and that the patient was evidently losing ground, having less strength and much dyspnœa on exertion, I suggested an operation.

This was attempted on the 7th, but, owing to an imperfection of the instrument, no fluid could be drawn out. The patient suffered only momentarily from the puncture. On 8th, I drew off fifty-four ounces of yellow serum, rapidly coagulating. The patient was a little faint after it. Crackling appeared in the compressed lung. In a few minutes after the opera-

tion he felt as he "did before his illness;" that is, all sense of oppression was gone. One half an hour after the operation, the urine, having been dark and small from the first of his illness, suddenly increased to double the usual quantity, and became thin and pale. Pulse 92, a little hard. Ordered to keep quiet, and take bread and tea for food.

Sept. 10. Abed from weakness, but nights much easier; no dyspnœa; little or no cough. By auscultation it appeared that the lungs had expanded to a level with the point of puncture. Dulness on percussion, and ægophony below, but less marked. Resumed Tincture of Iodine externally. From this time the steady improvement continued.

Sept. 12. (Fourth day after the puncture). There was crackling to the base of the lungs, and the ægophony was nearly gone. Pulse 80. Tongue and digestion excellent. Strength improving. Ale at dinner.

Sept. 14. (6th day from operation). No cough, fever, or dyspnœa. Only trouble was weakness. Urine natural the last few days. On full breath, a fine, crepitous râle to the point of puncture. Voice only a little modified. May have pigeon for dinner, and half a pint of ale.

Sept. 28th. (20th day after the operation). Had been gaining finely. Able to ride and walk out, and to eat and drink with relish. Countenance ruddy. Percussion still slightly dull at the lowest part of the back, but the respiration was heard everywhere without râle or ægophony. The murmur was not, however, free except on forced breath, indicating that the lungs did not even then expand with perfect freedom.

Oct. 6. Percussion equal in both backs, and respiration everywhere pure. By advice, he this day went into the country, and on 12th (that is just thirty days after the operation), at his return, he looked and felt better than he had been for many months. No cough or unpleasant symptoms, only slight dyspnœa on active motion. Physical signs—difference of pitch only, no real dulness. Voice well. A slight râle only, on full breath at the bottom of the lungs.

Allowed to go to his business, and has continued perfectly well up to the present date (Nov. 14).

Remarks.—The somewhat latent character of the disease in this case and the sudden relief, are as remarkable as in some of the cases previously detailed. The dyspnœa on the day before the operation had become very great, the nights were very restless, and the patient's whole aspect was that of a man suffering from severe disease, which, in spite of remedies, was progressing steadily. An operation was performed, and instantly a change took place. He felt as he did before illness; his dyspnœa left him; he slept tranquilly at night; his appetite improved, and all the functions of the body went on healthily. On the fourth day, the compressed lung had expanded, and on 20th day from the operation, the respiration was heard everywhere,

and the patient was able to ride, walk, and eat, like a man in health. Would he have progressed so rapidly if the operation had not been performed? Did it not only relieve, but likewise act as the great means of cure? The patient dates from it, the commencement of his cure: I believe him to be right in that opinion.

Case 22.—September 28, 1853.—Mr. ———, lawyer, I saw in Boston. He called at my office. His history was as follows:—Never very strong, but never any severe diseases till the present. This began last March, with some trivial pain in the left side, and cough, with little expectoration. He was believed to have slight pleurisy. The cough decreased much in May and June. Afterwards, all the symptoms had gradually augmented, but he had travelled much and had been able to walk freely, though easily put out of breath within the few weeks previous to calling at my office. He had experienced some difficulty of lying on his left side, and his cough had been more urgent, and within a week, it had been attended by retching and vomiting. His appetite had lessened, and he had been oppressed by food, with a slight tendency to diarrhœa for three or four months. Urine small, normal in color. Debility, emaciation; chills occasionally, and in the summer he had some sweats, none of late. At the visit, he appeared thin, and evidently suffering from long disease, considerable panting while speaking. Pulse 112. The cough, on that morning, had lasted for about three minutes, and had been quite harrassing. The respiratory murmur, was less, front and back, at the left than at the right side, somewhat obscure likewise at the top of the right. No râle anywhere. Flatness, changing with change of posture, and ægophony over the lower half of the back. Heart to the right of the sternum. He had had very little medical treatment.

I decided immediately, that the *first* thing to be done was to remove the collected fluid; accordingly, October 2d, I punctured in the usual spot, and drew off seventy six ounces of yellow, coagulable serum. The heart fell back at least 1½ inches towards its normal position. The murmur was heard more distinctly front and back. The percussion was less dull. Ordered to keep quiet, to take light food, Iodide of Potassium grs.ii. three times daily, and to use Tincture of Iodine externally.

From the time of the operation there was a steady improvement, though slow. On 5th, he reported no dyspnœa, and that the cough was very much relieved. Pulse 84, softer and fuller. Urine a little increased, and lighter colored. On 7th (5th day after the puncture), looked much better; wanted to eat more and to go out. He had sweats at night. Murmur heard to the base, and fine taffeta crumpling on full breath. Resonance of voice, which had been very marked before the operation along the vertebræ,

was much less. No ægophony. Heart in *normal position.* Walk out carefully; eat simple meats, half glass of ale at dinner.

October 22 (20 days after operation). Had sweated less. Able to walk two or three miles daily; felt he was gradually improving. Right side of the chest three-quarters of an inch *larger than the affected one.* Still quite dull tone on back. On full breath, lung seemed to expand with crumpling.

October 29 (27th day). Percussion almost equal in backs. Respiration heard indistinctly, but unequivocally, everywhere. General symptoms also much better; cough very slight; no sweating and countenance improving daily.

November 5 (34th day). His report was,—Had gained strength; cough, very little; no hectics; appetite and digestion perfect; on percussion, nowhere really dull, but least clear outside and under axilla; respiration very obscure there; resonance of the voice less, behind.

This gentleman is still under treatment, and daily improving. He attends now (Nov. 14) moderately to business. Whether the lung will ever come fully up, so that the murmur will be heard in both equally well, is a question I cannot answer,—time must decide. But as to the utility of the operation, no one can doubt. Look at the facts:—A pleurisy had existed, with a gradually augmenting effusion and increasing disturbance of the general system, from March till October 2. Then an operation was done. Immediately, a change took place. The dislocated heart resumed its natural position, and the circulation went on well. The lung, that for months has been compressed, expanded; the dyspnœa subsided. The digestive functions were restored. The hectics left; and all these events took place within a month! Surely, no one can doubt,—*first*, that the operation was the primary cause of the cure; *second*, that without it he would probably have gradually grown worse, and would have been an invalid for months. Possibly, after months, a fistulous opening might have formed.

Case 24.—October 14, 1853. E. C——. Æt. 40. Irish laborer. Always strong, but in former days had very freely indulged all his appetites. His disease commenced about the first of January, 1853, after a long exposure, during more than twenty-four hours, while endeavoring to restore to its proper place a locomotive that had run off the track. In addition to an exposure to a violent snow storm, he had had very hard labor. He felt at the time, that he had taken "a bad cold." Very soon afterwards, a cough began, slight and dry at first, with "stitches" in the right side. Once he had raised a tea-spoonful of blood, as he believed, from his throat. He did not work for three months. Finally, he undertook again to do so, although the cough continued, and he knew that he was weak and by no

means well. He was frequently disposed to vomit. This stomachic difficulty was much more troublesome than the pulmonary ones.

He continued vomiting more or less daily until July 19, when he had an access of it more serious than any of its predecessors. He was obliged to cease working from that time; and although able to go about the house and was often out of doors, he had been a permanent invalid till the period of his visit to me. In order to do this, he had walked upwards of two miles and a half, and without much difficulty. I learned that the vomiting ceased three months before; his cough had been less severe, but it was at times very harrassing; his appetite was very poor; he could not bear meat or liquors, because of the increase of the cough; his alvine discharges had been regular till a few days before his visit, since then he had been costive. He had had hectic paroxysms, but less for a period previously to my seeing him. Eight or nine weeks before that, he accidentally observed, on moving in his chair, that there was a "swashing" in his chest. This phenomenon had continued on every rapid change of posture. He had no pain or other serious symptom in connection with it. His aspect, at his first visit, was that of a man not very ill, but evidently suffering with dyspnœa, as evinced by his short, panting breath, his lividity, &c. Pulse 92, regular. Could not lie on right side because of cough, which last was least when he was quiet. *Swashing* heard at a distance from the patient; intercostal fluctuation perceptible to the hand placed on the side. Tongue, with a thin moist coat; appetite, very poor; costive; urine heavy, dark, smelling strong, and of the usual quantity.

Inspection.—Left chest bulged generally; no local prominence; by measurement $\frac{3}{4}$ inch larger than the right. Respiration wholly absent at the left; puerile at the right. On percussion, resonant in front; but it became totally flat when patient leaned forward to the horizontal position. Behind, flat in the lower half. Voice scarcely heard at the left; no ægophony. Natural at the right. A slight metallic echo (on speaking) in the left breast from under clavicle.

Advised to enter hospital, and to have a puncture made. The patient had, as already stated, observed the existence of fluid, and had asked the attending physician to "open his chest;" which the gentleman declined to do, on the ground (and a true one too, so far as it relates to the *opinion* of the profession), that the medical profession did not allow such a course to be proper or prudent treatment. October 21.—I punctured his chest at the hospital, where he was subsequently treated by my colleague Dr. Storer, until Nov. 1st, when I took charge of the wards. I drew off with the greatest ease, sixty-four ounces of pure pus. Considerable cough occurred during the operation, and one or two bloody sputa were raised; but otherwise he felt quite comfortable; he was bright in his mind, and was much relieved of "weight." Pulse 96. The lung, however, did not seem disposed to expand,

but air appeared to take the place of the fluid, and the metallic tinkling was heard throughout the left chest. Slight hæmorrhage from the puncture; stopped by a little lint and adhesive plaster. A bandage was applied to the chest to relieve the sense of vacancy.

This case is still (Nov. 10) under treatment. He has slowly, but steadily, improved in his general symptoms. He eats the house diet with relish. He has no fever paroxysm, and has more strength than for months past. The lung seems very slowly expanding. The "*swashing*" remains, but there is no return of the fluid. The left side isless than a quarter of an inch larger than the right; that is, it is half an inch smaller since the operation. The heart is still dislocated, though less so than before the puncture. A good vesicular respiration is heard to the spine of the scapula. Below that, to the angle, it is less distinct; also, still less in front. Outside, it is not heard. No crackling anywhere. A metallic echo is perceptible, with each vocal resonance, under the clavicle and below, around to the angle of the scapula. Above, to the spine of the scapula, it is distant. At the very apex it is not heard. I believe that the lung lies in contact with the parietes at the apex, at a short distance from it, down the back, and that it has expanded a little generally.

The prognosis in this case is doubtful. Evidently, the rational signs have improved. The patient feels and looks better. He can lie on the right side, which he could not do. He eats meat now, which distressed him and increased his cough previously. The lung likewise has expanded slightly. From week to week it seems very slowly getting larger. I have determined that if the fluid returns again, I shall puncture and inject into the cavity Tinct. of Iodine, as recommended by Drs. Boinet* and Aran.† I see no objection to using such treatment, even where air alone exists; but I prefer to wait for the present, while the patient continues to improve.

Case 24.—This was a case attended by Dr. J. M. Warren, which he kindly allowed me to see. I saw him October 20, 1853. Æt. 21. A farmer. It appeared he had been ill with pleurisy since March. He had, however, been able to walk out of doors, from two weeks after his first attack. In June, he suddenly began to raise a large quantity of pus. This raising of pus and mucus daily, had continued up to the hour of my seeing him. It was then amounting to about a quart in the twenty-four hours. His pulse was quick, 118 to 120; he was emaciated, but still did not look exactly tuberculous. His appetite was good; his bowels were regular. No hectics. Gurgling was heard on succussion. The right side was larger than the left, but no part of it was pointing. There was total flatness on percussion, from the top to the base of the lung, front and back. Crackling at the top, but no tubular sound or extreme vocal resonance in front.

* Archives Générales de Médecine. † L'Union Medicale, August, 1853.

Dr. Warren punctured between the 8th and 9th ribs behind, and one pint and a half of pus was removed with ease. The patient felt relieved. Crackling was heard lower down, and the respiratory murmur was heard along the spine, slightly but unequivocally.

November 5. He visited Dr. W., in Boston, who found him much better, and the lung was expanded much more. I did not see him. He remains still under treatment. He came to Boston, thinking to be operated on again; but Dr. W. found such improvement in the rational and physical signs, that he forbore.

Ten days afterwards, November 15 (26 days from the first operation), I saw him again. He reported that for several days after the puncture, he had coughed scarcely at all, and had improved much in his general feeling; but within a week the cough had been as bad and the expectoration as copious. On percussion, there was some resonance to an inch above the angle of the scapula, and the respiration was heard there, but still much less throughout the side than on the other lung. Twelve ounces of pus were removed with much comfort, and the patient returned to the country.

Is not this a proper case for a permanent opening and for iodine injections? Air evidently gets into the pleura through the lungs, so that the objection of admitting the external air by a permanent opening is not valid. 2d.—The pus now accumulates, and has to be *coughed up*. Would it not be better to let it *run out?* Probably, the cough would be much lessened thereby.

Case 25.—Sept. 28, 1853. I saw at S., in consultation. He had been ill from March, and particularly so from July, with acute pains in the left side at this latter period. His symptoms were those of pleurisy, following tubercular disease. He had cavernous respiration at the upper part of the left lung in front. The heart was not dislocated, and it had a strong thrill with each pulsation. The lower half of the back was quite dull, with absence of respiration, a broncho-ægophonic vocal resonance. Notwithstanding the cavernous respiration and the non-dislocation of the heart, I was disposed to regard part of the symptoms—dyspnœa and œdema, &c.—as, in a measure, caused by an effusion, to a small amount. I proposed, therefore, a puncture, although satisfied that serious tubercular disease existed at the apex of the lungs.

Oct. 1.—Having tested still further the existence of fluid, by a change of posture, I punctured a little outside of the line from the angle of the scapula. No fluid could be obtained—and I desisted. The patient suffered no inconvenience. I would mention, that before operating I stated that such might be the result, and that if any fluid came it might not give relief, but that, considering all the signs, I should advise that the operation should be done. No subsequent evil resulted from it. It may be asked, why no fluid was

obtained. The answer is difficult. Such an event has happened before—vide cases 5 and 6, also once in case 9. I think it very probable the lung was punctured. The case is interesting as showing the innocuousness of the operation, whatever may have been the nature of the case.

Case 26.—Sept. 12, 1853. Mr. ——, I saw in consultation. Æt. 60. He was a gentleman well known in political life, and of a very active temperament. He had been ill from February. He had had cough for some weeks, but never pain in the side—nor dyspnœa. He had had hæmoptysis slight, in the early part of the disease. From the first, he had felt that he should die, and, therefore, was unwilling to use remedies. When I saw him, his mind had become very dull, and he lay most of the time without speaking or eating. Pulse, 80 to 100. For several days he had taken little food. There was dulness at the right back, and less murmur throughout same side. The dulness changed with the position of the patient. At the bottom of the right back there was a prominence, feeling solid, but elastic, and separating the ribs. It resembled the lobule of a scirrhous mass, but there was no discoloration of the superficies. I advised the puncture, feeling that it was the sole chance of possibly relieving him. Great objection was made to it for several days. Finally, I was requested to see him again. I then, for the first time, knew of the existence of the tumor. He was so much sunken, and the prospect that combined with the pleurisy there was malignant disease, the knowledge that the patient himself was opposed to all attempts to cure him, determined me not to operate: I therefore declined.

Following* is a tabular statement of the prominent features of all the cases I have had under my own charge since April, 1850, with a few treated by others, and which I saw in consultation.

From this tabular statement we see that—

First, No one of the patients operated on experienced a single dangerous symptom, or any materially unpleasant symptom, except for a short period.

Second, Out of twenty-five persons, only three failed of obtaining relief. Of these three, two had had lung, probably tubercular, disease; and from the other no fluid could be drawn, owing, perhaps, to an imperfection of the instrument which I used in my earlier operations.

Third, In more than half of the cases, the puncture was the first remedial agent, that decidedly arrested the progress of the disease. This it did in two modes. 1st, by allowing the lung to expand immediately, and producing thereby a rapid cure. 2d, by so stimulating the functions of the body, made torpid by long disease, that they immediately, sprang into healthful, vigorous action, while the lung expanded more slowly. Cases 7,

* See pp. 42—46.

14, 15, 18, 20, 21 are illustrations of the first, and 1, 8, 11, 12, 22 of the econd class.

That this stimulus which I have mentioned as occurring in the second class, actually takes place in many cases, I am sure. I have so repeatedly noticed it that I now confidently hope for its occurrence, when I do not find that a case, after a puncture, is likely to be of the first class. I do not mean to state that the stimulus shows itself immediately, or that it acts with rapidity in every case, but simply that from the moment of drawing off the fluid, I have been able to trace a series of favorable influences tending towards health.

Fourth, In about *seven-eighths* of the cases, the operation has given *great relief* to prominent and distressing symptoms, insomuch that the patients have asked for a second, third, or fourth puncture, as a means of relief only.

Symptoms Consequent on the Puncture.

These were very similar to those reported in my former paper. The pain of the puncture was the chief trouble, and this, as it was momentary, was but little noticed by the majority. Stricture across the chest was occasionally noticed towards the end of the operation. The cough was augmented in many. This I regarded as a favorable sign, as it usually indicates that the compressed lung is beginning to expand. In one case this symptom was excessive, it having lasted twenty-four hours almost without intermission. In this case the lung arose instantly from its compression. One had vomiting of her dinner, the operation having been done in the afternoon. In all, where fluid was obtained, the oppression was somewhat relieved; in one, impending suffocation was prevented. Most of the patients were exhilarated by the success of the operation, as in our previous set of cases. In one, there was a slight oozing of blood from the point of puncture, which, however, was easily checked.

The *pulse* remained tranquil, as much as it was before the operation.

The *digestive* functions were improved. In all, where much fluid was obtained the appetite was improved with singular rapidity. One person asked for food before we left the house.

The *urine* was augmented frequently by the operation, a fact which I noticed often when analyzing the first set of cases.

In *none* was the fever augmented, or a febrile paroxysm excited.

The physical signs altered slowly in some cases, in others very rapidly. The patient in case 15, having been ill a few weeks, presented the phenomenon of the lung completely expanded and filled with râles the next day after the removal of five pints of fluid. Generally, however, a more slow process was carried on, the lung expanding in the first few hours only along the vertebræ and at the apex, and thence more or less gradually rising to meet the parietes of the chest; the parts under the axilla being, of course,

the last to fill out. In some instances that state of the lung described by Gardner,* remained for months, the patients being nearly free from all rational symptoms of disease, save, perhaps, a tendency to dyspnœa. Cases 4 and 14, are examples of this. Cases 22, 23, may become so.

The character of the fluid drawn from the chest varied, as in our other category of cases. By a reference to the tabular statement, it will be seen that from forty-seven punctures, the following results were obtained:

TABLE 2.

Nothing,	5 times.
Serum, a few drops only (2 cases),	4 "
Serum in large quantities,	16 "
Pus, or purulent,	17 "
Bloody,	5 "

The *quantity* of the fluid varied considerably; three ounces being the smallest, one hundred and seventy ounces being the largest. In this latter case it was pure pus.

The influence of the character of the fluid, the length of the disease previous to the operation, and the existence or non-existence of previous disease, may be learned by the following series of tables.

TABLE 3.

Character of the fluid in the Chest.	Serum.	Pus.	Bloody.	Total.
Recovery from pleuritic effusion,	7 cases,	5 cases,	1 case,	13 cases.
Death afterwards, consequent upon the effusion and previous disease,	3 "	4 "	1 "	8 "
Friction-sound heard, but death a few weeks after from disease of brain,	1 "			1 "
Under treatment, doing well,	1 "			1 "
Under treatment, with prospect of months of illness,		2 "		2 "
				24 cases.

It seems, therefore, that the presence of serum is more favorable for the prognosis than is the existence of pus. This only confirms our preconceived notions, but it is rather different from the opinion I advanced in my previous paper, the facts contained therein not allowing me to hold the opinion I now advance.

The next important element in the prognosis, is the length of time the disease has lasted previous to the operation. The following table will show this.

TABLE 4.

		Serum.	Pus.	Bloody.
Average time before puncturing in cases of,	recovery,	2½ months,	2 months,	
	death,	3 months,	4½ months,	3 months.

Whence it appears that whether pus or serum exists, an early operation is more favorable than a later one.

* British and Foreign Medico-Chirurg. Review, April 1853, Art. XI.

The influence of the existence or non-existence of previous disease may be illustrated by the following.

TABLE 5.

	Of those who had no disease immediately preceding the effusion,	Of those who had cough, and were probably phthisical,
Recovered from the effusion,	10	4
Died with effusion remaining,	0	6

From this table we infer, what, in fact, we knew before, that pleuritic effusions, uncombined with serious pulmonary disease, do not usually destroy life. I cannot but think, however, that in case No. 2 the operation may be said to have saved life, for a time, at least. In case 15 I have no doubt suffocation would have taken place, had not the operation been performed.

Another interesting inference is suggested by this table, viz., we observe that of 10 who had organic diseases, 4 were cured of the pleuritic effusion: 6 died. Now, the puncture was the *sole* cause of the cure of these four, for the lung expanded in all of them within twenty-four hours or a few days after the operation was done. No other cause operated, and therefore to the thoracentesis we must attribute the cure. Is there any physician that can say as much of any other method of cure under similar circumstances? Is there any remedy which will cause an absorption of five pints of fluid in twelve hours, and allow a lung that has been compressed for months to be thoroughly filled with air in twenty-four hours?

In confirmation of these remarks, and to give the reader a more definite idea of the *amount* of influence the puncture had towards the *cure* or *relief* of the effusions, I submit the following data taken from my own cases, compared with similar data obtained by the courtesy of Mr. [redacted] Seavern, at present house-pupil of the Massachusetts General Hospital, from the records of that institution. In preparing my own, I have taken, *first*, all those cases in which the lung, after having been for weeks, or perhaps for months compressed, has suddenly expanded, within twelve or twenty-four hours after the puncture; *second*, those in which the stimulus above spoken of was given to the various functions of the body, so that all the rational signs grew decidedly better from the moment the fluid was evacuated, while the long-compressed lung dilated but slowly.

In the first, the lung expanded immediately, or within twelve hours after the puncture. In the second, the lung, on average, in $32\frac{1}{3}$ days, or $4\frac{4}{7}$ weeks after the puncture.

I think no one can doubt that paracentesis *cured* the disease in the first class of cases. In proof that it aided very materially toward the same

results in the second class. I present the subjoined table of comparison between my cases and those treated at the hospital.*

TABLE 6.

Length of time the disease lasted.	Hospital cases.		My cases.	
	Whole length of the disease.	After entering hospital.	Whole length of the disease.	After Thoracentesis.
Average duration in cases of complete filling of one pleural cavity,	12+weeks.	$6\frac{5}{8}$+weeks.	13 weeks.	3 weeks.
do. do. partial do. do.	12 "	$6\frac{1}{2}$ "	$9\frac{1}{4}$ "	4 "

Supposing all these data to be *absolutely* correct, I might draw from them the following propositions.

1st. *One pleural cavity being full of fluid.—a.* Thoracentesis shortens the disease more than *one half.*

2d. *One pleural cavity being partially filled.—b.* Thoracentesis shortens the disease more than *one third.*

I do not, however, present them as absolutely correct, but merely as approximations to the truth. But I do not see that any one can deny, that puncturing the chest does very materially shorten, and consequently alleviate the sufferings of a patient affected with pleuritic effusion. As if in confirmation of this view, we see that although it appears, in my cases of complete filling of the pleural cavity, that the whole duration of the disease was perhaps as long as it was in the hospital cases, nevertheless there was this great difference of time after the two treatments were commenced, before the effusion was removed; viz. those treated by paracentesis getting well in half the time required by the hospital treatment. I do not believe, however, that thirteen weeks shows the duration of the disease as it will be when tapping is resorted to with as much freedom as we resort to calomel, blistering, &c. For this period of thirteen weeks is really owing to one case, which had lasted *seven months* before a puncture was made. Excluding this case from the calculation, we shall get $7\frac{3}{4}$ weeks as the average total duration of cases of pleurisy treated by paracentesis, in connection with other remedies. I will go still farther, and avow my belief that ere long, when we shall puncture *early* after an effusion has occurred, the disease will often be relieved in a much shorter time even than $7\frac{1}{2}$ weeks.

* This table is founded on data drawn from fifty-four cases of pleuritic effusion, found recorded in the books of the hospital, between Jan. 4, 1847, and Sept. 9, 1853. In it I have made use of those cases only, in which the disease could be traced by the rational and physical signs to its termination in the hospital; or, if the patient left the hospital before recovery, but after a *long* residence at the institution, I have added the sign + to the number of months the case was under the care of the institution. From my own cases, I have only taken those of a similar character, viz. Nos. 1, 7, 8, 11, 12, 15, 18, 20, 21.

If this be so, are we not morally bound to perform this operation early in all serious cases; that is, in all where there is any considerable amount of fluid, enough, for example, to cause flatness in the lower half of the chest? I am well aware that I shall be met with arguments drawn from the *danger* of the operation. I consider this argument as *null*, when applied to the *exploring canula and suction pumps* used in all my cases. I believe this fear is a *phantom* that has descended to us from a bygone race of men, who were as intelligent, it is true, as any of the present day, but whose means of diagnosis of thoracic disease were *infantile* when compared with our own.

In what cases should an operation be performed?

In my former paper I stated fully the cases in which I should hereafter advise an operation. As I have seen no reason to materially change my mind since that time, I shall transcribe some passages merely. I wrote then:

1st. There cannot be a doubt that it should be performed in all cases, either acute or chronic, in which there is dyspnœa sufficient to threaten death.

2d. I believe that the case of the little child about whom I was consulted in 1849, proves conclusively that the operation should be performed where the pleura is *distended* with fluid, even if the dyspnœa is not permanent, but only paroxysmal, the patient being in the interval comparatively easy. Life might have been saved in that case, if the puncture had been made: but the little patient seemed so well, that we decided to defer it till a more serious symptom should occur. It will be remembered that that very night the patient died in a sudden attack of dyspnœa.

3d. I think that we ought to operate in a somewhat chronic case, where these paroxysms occur, even if the chest be only partially filled with fluid. I saw a man who had been ill about three months, and had evidence of fluid filling one-half of one pleural cavity. It was thought best to try remedies before puncturing. In three or four days he suddenly expired in an access of dyspnœa.

4th. In all *acute* attacks, where the remedies employed do not seem to produce ready absorption, the operation should be performed. Dr. Hamilton Roe says that three weeks is the longest time we should allow the fluid to remain in the chest.* I agree with him fully.

5th. In all effusions, where one side of the chest is full and distended with fluid, I shall advise it, even if there be no great dyspnœa or other serious symptoms; *a*, because it is not uncommon for one having a pleura *distended* with fluid, to die; *b*, because the operation can do no harm; *c*, it may prevent a tedious illness; *d*, because it may oppose tendencies to the development of tubercles; *e*, it will probably prevent future contraction of the chest; *finally*, because in that way an external opening and a harassing fistulous discharge may be avoided.

6th. Case VIII. proves that, although in a very acute case the puncture may not prevent the re-accumulation of the fluid, nevertheless, the operation may be of great service in relieving the prominent symptom of dysp-

* London Lancet, vol. ii., 1844, p. 190.

nœa, and in helping on the more rapid cure. It may, therefore, become a question whether even a small quantity of fluid should not be removed within a week after the first attack of acute pleurisy. Time and future cases must decide this. Upon this part of my subject, I cannot refrain from quoting the remarks of the reviewer above alluded to. "The whole argument turns on the facility and safety with which paracentesis can be performed, and although the cases are not sufficiently numerous to allow us to recommend it as in all cases practicable and useful, yet they warrant us in stating, that this operation is one of which practitioners have too much dread; and that, when skilfully performed, it may be practised with very little hazard to the patient, and with a result, in the majority of cases, that is satisfactory to the practitioner." *

Objections to the Operation.—There are two classes of objections (viz., theoretical and practical) brought against the operation of paracentesis thoracis. I confess they are very formidable, nay, insuperable, when applied to it as recommended in most books of surgery. It leaves an open, gaping wound, through which may rush the external air with each movement of the thorax. I will not say that this method may not be useful in some instances. Doubtless it has been, and it may be so again. But the modern European method by trocar and canula, as performed by Trosseau and Hughes, &c., and especially as it has been modified and improved by Dr. Wyman, is one of the simplest and safest of all operations. Still there are objections, theoretical and practical, brought against it. Let us consider, then, their value.

1st, It is said that the chest, being a bony cavity, cannot contract; *ergo*, you never can get out the fluid, or you do so at the risk of injuring the lungs; the objector forgets that the diaphragm and intercostal muscles prevent the thorax from being a bony cavity, and do allow of some contraction. Still further, by means of the suction-pipe, we draw out the fluid, and thus form, perhaps, a vacuum in the pleural cavity. The compressed lung dilates: the other lung likewise admits more air and crowds into the empty space.

But, 2d, The objector adds, by forcibly compelling the lung to dilate, you run the risk of seriously injuring it. How do you know this, save by experiment? Now, experiment proves that nature always gives us notice, by the suffering of the patient, how far we may go in the operation of suction. I have myself operated twenty-three times,† and Dr. Wyman has done so many more times, and in no single instance has any permanent evil resulted from this cause. We have always desisted the moment any complaint was made by the patient.

3d, It is said, you cannot draw out all kinds of fluid. Very true, there may be such cases, I have met with them; but, I think, they will be less numerous as we become more accustomed to the operation, and it is done more properly.‡ Besides, we can always, if necessary, have recourse to the old operation, if the trocar fails.

4th, But you will let the air into the pleura. This, to some minds, is a serious theoretical bugbear. The admission of a small quantity of air does not necessarily cause trouble, unless it be frequently repeated, as in cases of

* London Lancet, vol. ii., 1844, p. 301.

† Jan. 18, 1854. Up to this date, *fifty* times, with the results as above.

‡ The result since, in my own practice, has confirmed this.

pneumo-thorax, and of puncture of the thorax, according to the old operation. I have seen air accidentally *pumped into* the chest, instead of fluid being drawn out! And this caused no injury. The patient never knew of it by his own sensations. I do not believe it excited any inflammation. I am not alone in this opinion. Other operators believe the same; for they have observed the same accident, with similar results attendant thereupon.

5th, You run a great risk of exciting pleuritis by the puncture of the delicate pleural membrane. It is a sufficient answer to this objection that, at the autopsy of cases in which persons have died from other diseases, after a puncture with a fine trocar, no evidence of inflammation from that cause has manifested itself. Case I., given above, also proves it, by showing a similar non-purulent fluid drawn out on two successive operations. Dr. Wyman has noticed this frequently. I have never known pleuritis to ensue.*

6th, You may injure the lung, or strike some other important organ.

Very true; but, 1st, I deny that a puncture of the lung is so very dangerous. It has been done. It was done in a case, as Dr. Wyman believes, under Dr. W.'s care. I have done it. I have seen another do it, and, moreover, use the suction-pipe while the trocar was in the lung. In no case has any evil resulted. The sputa were, in one case, slightly tinged with blood soon afterwards, but no unusual pain or distress resulted to the patient. But, 2d, these are exceptional cases. If our diagnosis be conscientiously and thoroughly made, we need very rarely injure the pulmonary structure. If we injure any other organ, it will generally be owing to our own carelessness.

7th, The intercostal vessels or nerves may be injured by the trocar.

This is possible, but not probable. 1st, It would be difficult, in fact, to strike and seriously injure the artery, because the trocar is so small that a small artery would most probably glance aside. 2d, The spot for the operation may be chosen where the vessels are the most minute. 3d, The operator, of course, will thrust the instrument as near to the upper edge of the rib as is possible. 4th, Finally, among all the operations performed within the past three years in Boston and its vicinity, no serious result has happened to the artery, although, in one case, I observed some slight and temporary hæmorrhage after the withdrawal of the trocar.

8th, One objection brought against the operation is the following, viz.: That all cases of chronic pleurisy will get well after a time, unless the disease be dependent on more serious lesion of the lungs, or other remote organs. In answer, I would say that, according to my experience, in part already given above, it is not true that a person affected with chronic pleurisy, as an idiopathic disease, will eventually get well. He may die, as we have seen, in various ways; which result a puncture and extraction of the fluid may prevent. But, still further, is it of no use to shorten the disease by months? Is it of no service to prevent fistulous opening, and those terrible distortions of the chest consequent on the cure of long pleurisy? Moreover, suppose that tubercular or other disease exists, is it of no service to raise our patients from their bed, to give freedom of breath, and to actually lengthen life, as was done in cases II. and VII. XV. XX.?

* Since this was written, I have noticed in one case, in which several punctures were made, that the fluid becamemore purulent at each successive operation.

Again; I believe that this operation will be used with advantage in *acute* disease, and may, likewise, shorten *its* course. Case VIII. shows this, where the patient, on the twenty-third day, was up and preparing her dinner, and the effusion subsiding. Case VII. is a still more striking example of this; *i. e.*, if we regard the pleurisy as having commenced when the pain in the side began. If this be so, then the cure was complete in a very few days after the operation.

9th, Finally, some object to the operation because of the uncertainty of diagnosis. You may operate in a case of cancer of the lung, or gangrene, or some other disease than pleurisy.

I can conceive of such an error being made in some very rare cases, but I do not believe that such cases will be likely to happen very often; and, moreover, as I have already said, I think that a slight puncture of the lung with a small trocar is of very trivial moment. We may, therefore, very justly put aside this objection as one of little value against the operation.*

But shall we confine ourselves to a simple puncture and a withdrawal of the fluid? In my previous paper I alluded to the operation by the scalpel, as a barbarous one. I would modify my statement; I believe there are cases in which a *permanent* opening would be of service. In cases, for instance, where repeated punctures have been made with as repeated re-accumulation of the fluid, a fistulous opening may be needed. Case 24 may be one in which it would be well to make such an opening. But even in such case, *frequent* puncturing might answer the same end. And suppose we have decided to have a permanent opening, why not operate with a large trocar, or leave it in the wound for a few hours or even days, as is actually done by Barth and Windrict?

But shall we merely remove the fluid? I think not. The recent obvations and experiments of MM. Boinet and Aran in Paris prove conclusively not merely the safety, but the advantage in some instances, of injections of tinct. iodine. Both of these gentlemen give cases† of great interest, in which the iodine seemed to improve the secretions of the pleural cavity and help the cure.

Finally, although thoracentesis in pleuritic effusions has not always effected all the good I could have wished; although, in some instances, it has seemed to do little more than give temporary relief; nevertheless, I am convinced, from the experience I have gained from the preceding cases, that in some instances it saves life, that in a vast majority it gives infinite relie to distressing symptoms, that in none does it cause any harm. I sincerely

* At times, too, a mistake may arise from the lung remaining, as described by Dr. Gairdner, of Edinburgh,* condensed after the effusion has been absorbed or removed; in consequence of which state of the parts, there may be absence of respiration, flatness on percussion, diminished motion of the ribs, &c. All these signs may lead into error. I am now inclined to believe that I made that mistake in case VI. possibly I did so in case XXV. No evil followed in either case. The patients scarcely noticed that the puncture had been made (1853).

† Archives Générales de Médecine, May, 1853. Union. Medicale, Aug. 1853.

* See British and Foreign Med-Chirurg. Review, as cited above.

hope, therefore, that these facts may serve to overcome the prejudice existing in the minds of the profession, to the operation, *at least, as it has been performed on the subjects of this paper.* For myself, unless my present views change very materially, I shall feel that I am guilty of a neglect of a duty to my patient, if I do not urge the operation, in any case, after the existence of effusion has been manifested a few weeks, and when remedies do not seem to effect its cure. I shall feel bound to use it in any case of *large* effusion, however short a time it may have existed. I shall, in other words, regard thoracentesis as I regard other remedial agents, to be used as freely as I use them, viz., whenever I think necessary.

In connection with, and as a most fitting conclusion to these remarks, I cannot forbear quoting from a letter which I received from a gentleman well known in this country and in Europe, and who has had as much experience on this subject as any other individual on either side of the Atlantic. Under the date of June 2d, 1852, he writes, "It has indeed surprised us as well as yourself, that so simple, so harmless, and so beneficial an operation (when proper precautions are taken, by competent observers), has been so little regarded in America or England, where it most strangely continues to be esteemed as a most important and serious one." "It may be interesting to you to know that I have myself been present at, directed, or superintended, at least eighty, and, I quite believe, one hundred operations of paracentesis thoracis," [by puncture with an exploring trocar and the subsequent introduction of a larger one, and without the use of any suction pump.—H. I. B.], "and I never knew it, in any of those cases, do any injury; that in a vast majority of these instances, it has been attended with marked benefit; and that in many, where a cure was possible it has been the important element in effecting that cure."

Appendix. Since finishing this paper, I have perused an article in the Archives Générales de Médicine, for October, 1853.* As it supports views similar in many respects to those advanced in the foregoing article, and is of such recent Parisian date, I propose to make a brief analysis of it. It gives details of four cases of acute pleurisy; in all of them, thoracentesis was performed. Three were cured by it as the chief remedy. In one there was a relapse and illness for an unknown series of months. In those cured, the average duration of the disease *before* the puncture was $13\frac{2}{3}$ days; the duration *after* the puncture was 17 days. In other words, a period of $30\frac{2}{3}$ days was the length of time the disease ordinarily existed. (See Table 6.)

After these cases, the author discusses the various methods used in puncturing, and decides in favor of the trocar and canula, with the moistened tube attached to the latter, the end of which, after the removal of the tro-

* De l'Utilité de la Thoracentese. Par B. Schnepf, interne des hopitaux, Laureat de la Faculté de Médecine à Paris.

car, being placed in water prevents the entrance of air, and acts like a syphon, in gradually drawing off the fluid. He alludes to the fact that in Germany the canula is, at times, left in the wound for some days, and without difficulty. M. Barth has done so. He speaks of the fear of the operation formerly entertained by Louis, Arndal, Skoda, &c., and says that at present these gentlemen approve of the operation. In looking at the beneficial results of the operation, he records the sudden healthful stimulus given to all the functions, exactly as it was noticed in our cases. The operation may be used as a means of *relief* only. He regards *it as almost a specific remedy in acute pleuritic effusion.* The author attributes, rather hastily, I think, the cough which came on in his cases, after the puncture, to the irritation of a little air admitted to the pleura. Valleix and Barth oppose this view, but advance opposite views, as to the real cause, the former believing it to be owing to the sudden *dilatation of long-compressed vesicles ;* the latter holding exactly the opposite view, and contending that the fact that the *vesicles can not expand* is the cause.

(Our cases sustain neither of these views entirely. In case 15, the cough was more severe than I ever knew in any of the observations, yet the lung expanded immediately throughout its whole extent. In 20, on the contrary, though the lung dilated, there was little cough. In cases 13, 23, the cough was troublesome while there was no evident sudden dilatation of the lung.)

Iodine injections into the pleural sac are examined. The cases detailed by Aran and Boinet (see above), are alluded to. M. Barth has punctured five times in one case, and used chlorinated injections. Valleix, also, has used iodine with freedom and without injury. Soft, warm water is useful at times. Raumberger, on the contrary, opposes all such proceedings, on purely theoretical grounds, which are proved to be unsound.

His resumé may be generalized thus: 1st, The operation is not dangerous; 2d, A trocar and syphon tube is the best instrument; 3d, A little air in the pleura aids the flow of the fluid; 4th, The results are, a more free and regular respiration, renovation of the forces, better hæmatosis, &c.; 5th. In simple pleurisy, thoracentesis is "the most powerful agent to hasten a cure;" 6th, When symptomatic of other more serious disease, it is an adjuvant alone. (Our cases 4 and 15 prove that puncture cures pleurisy even when connected with, if not caused by phthisis.) 8th, It ought to be performed whenever the dyspnœa makes us fear asphyxia, and as early as possible from the attack. 9th, It is contraindicated in imminent asphyxia. (Case 15 proves this assertion to be incorrect. I cannot but think it wrong; for I believe that the more imminent the danger of asphyxia, the more important it is that the operation should be performed.) 10th, A little air in the pleura does no harm, but is rather useful, as above stated. 11th, Lesions of the lung or intercostal arteries, during thoracentesis, are not noticed by modern authors.

Tabular Statement of Operations for Paracentesis Thoracis, performed between April, 1850, and Oct., 1853.

No.	Age and date.	Profession.	Previous diseases.	How long sick before first operation.	No. of operations and dates.	Character of the fluid.	Amount of the fluid.	Immediate effects of the operation.	How soon the lungs expanded and heart fell into normal position.	Final result.
1.	28. April 17, 1850.	House Painter.	none.	5 weeks.	1st, Apr. 17 2d.	nothing. pus.	℥ ix.	relieved of oppression at chest.	not immediately and doubtful how soon—less than 4 weeks.	perfect health after 5 or 6 months.
2.	56. Oct. 1, 1850.	Seaman.	dyspnœa for 6 or 7 y'rs—probably heart disease.	at least several months	1st, Oct. 1 2d " 12	serum. serum coagulable.	℥ xxxvi. ℥ xxxij.	great relief; orthopnœa gone. some "drawing" around chest.	on 5th day, or perhaps sooner; friction sound next day.	death many weeks afterwards with cardiac disease.
3.	28. July, 1850.	Machinist.	rheumat'm: soreness for 3 months in left breast.	3 months.	1st, July 10 2d, " 12 3d, " 14 4th, " 19 5th, Aug 11 Two natural openin's subsequently formed.	bloody. serum. more purulent.	few drops. ℥ i. ℥ xxvi. . . . a little. Oj.	easier, pulse better, relief to distension and to pulsation of the heart to the right of the sternum. marked relief to dyspnœa.	heart fell immediately toward left two inches.	gradually failed, and died about the middle of August.
4.	48. June 4, 1850.	Carpenter.	Had raised blood many times.	10 weeks.	1st, June 9 2d, " 11 3d, " 11 5th, Nov 19 6th, " 21	purulent. nothing. purulent. nothing. pure pus.	few drops. ℥ ix. ℥ ix.	great relief. stronger. relief.	20 days after operation "respiratory murmur better," less dull percussion. rubb'g sound at the point of puncture.	gradually got well after many months; chest contracting and lower lobe remaining condensed.

5.	6. July 14, 1851.	Girl.	unknown.	unknown.	1st July, 14 2d " 3d "	serum. do. do.	a few drops merely could be drawn.	no effect, neither relief nor trouble.		nearly in articulo mortis, and died soon.
6.	18 or 20 years.	Young man	unknown.	unknown.	1st, 2d,		nothing.	do.		unknown.
7.	29. Aug. 21, 1851.	Spinster.	cough and diarrhœa for many months.	2 weeks.	1st, Aug. 23	serum coagulable.	℥ xli.	unpleasant feeling about chest, but soon great relief. Heart fell back 1½ inches.	next day murmur he'rd everywhere; minute crepitus.	well of effusion in a week—died a year after, of phthisis.
8.	31. Sept. 3, 1851.	Wife.	pleurisy pain years ago, but well after.	10 days.	1st, Sept. 3	serum coagulating on standing	℥ xiii.	great relief—no orthopnœa afterwards	next day.	well by 12th day after operation. Patient attended to household duties. A few physical signs remained.
9.	20. Oct. 17, 1851.	Clerk.	cough, winter previous.	48 days.	1st, Nov. 1 2d, " 3d, Dec. 13 4th, Jan. 14 5th, Feb. 9	yellow, amber-like. a little opaque. more purulent.	℥ xxviii. ℥ xviii. ℥ xxi. ℥ xxi.	great relief—no severe dyspnœa after 1st. Patient desired all the rest when he found dyspnœa coming on. Cough bad after them all, stricture after last.	lung expanded somewhat at apex—never fairly distended.	after many mo's died of phthisis.
10.	30. Feb. 17, 1852.	Rigger.	cough for a year.	71 days.	1st, Feb. 27 2d, " 3d, 4th,	purulent. " " "	a little. ℥ xv. ℥ iii. nothing.	great relief to distress of patient. patient almost in art. mortis at time	not at all.	death on 4th, after last operation.

Tabular Statement of Operations for Paracentesis Thoracis.—Continued.

No.	Age and Date.	Profession.	Previous diseases.	How long sick before first operation.	No. of operations and dates.	Character of the fluid.	Amount of the fluid.	Immediate effects of the operation.	How soon the lungs expanded and heart fell into normal position.	Final result.
11.	59. Dec. 29, 1852.	Soldier.	none kno'n, character dissipated	5 weeks.	1st, Dec. 29	yellow serum.	℥ xxiii.	relief to fulness—able to lie on either side.	lung came up slowly—friction noticed 30th, perhaps before.	death two mo's after with cephalic symptoms.
12.	21. Feb. 27, 1852.	Wife.	cough during autumn	6 weeks.	1st, Feb. 27 2d, natural opening subseque'ly took place.	thick pus.	℥ xli.	great relief to orthopnœa and general uneasy state.	lung had expanded somewhat on 5th day; on 11th much more	perfect health after many mo's.
13.	40. Dec. 30, 1850.	Laborer.	slight dry cough a week before fall which caused his pleurisy.	5½ months.	1st, Dec. 30 2d, Jan. 10	pus. pus.	℥ lxiv. ℥ clxx (!)	great relief to dyspnœa and moaning, cough after puncture.	lung did not come up readily before death.	death from opiate.
14.	24. March, 1853.	Clerk.	cough years ago, but well before acute attack.	12 days.	1st, M'ch 20	serum, coagulating	℥ xlviii.	relief—dates recovery from operation.	next day lung expanded at upper part; lower never did.	recovered, with condensed low'r lobe after mo's.
15.	45. June 10, 1853.	Wife.	cough for many mo's.	6 weeks.	1st, June 10	do.	℥ lxxxiii. and ℥ vi.	entire relief from threatened suffocation—bad cough—pulse fell—copious frothy expectoration.	immediate expansion of major part of lung.	10 days no difference on percussion of both lungs; well of pleurisy.

16.	July 11, 1853.	Laborer.		4½ months.	1st, July 11 2d, Aug. 5 patient asked for operation.	col'd serum, do.	℥ xxiiiss. ℥ xiii.	respiration less labored—comfortable day—little relief.	no physical signs given.	death some days after last operation.
17.	6 yrs. Oct. 20, 1853.	Boy.	*	many mo's.	1st, July 18	pus.	℥ xiii.	slightly easier.	never.	death mo's after.
18.	19. July 18,	Clerk.	none.	7 months.	1st, July 19	serum coagulating	℥ lxxx.	no immediate trouble, and all the functions of the body immediately began to go on well.	murmurs heard to base of lung next day.	perfectly well in about a month or six weeks.
19.	20. July 30, 1853.	Wife.	cough for months.	5 months.	1st, July 30 2d, Aug. 3	pus. pus.	℥ x. ℥ iv.	strict'e and faintn'ss relieved on lying down; can lie on left side; rel'f to cough.	no marked ch'ge except tubular respirati'n more manifest.	death in two weeks, with tuberculous lungs.
20.	23. Aug. 30, 1853.	Spinster.	cough for months.	2 months.	1st, Aug. 30	serum coagulating	℥ xviii.	nausea, vomiting, little cough—felt as if "had lost part of her side."	heart fell to place—next day crackling thro'-out expanded lung.	in 10 days no effusion remaining—equal resonance in back. dyspnœa (?)from tubercles remaining.
21.	42. Aug. 18, 1853.	Governm't Officer.	rather weakly.	6 weeks.	1st, Sept. 7 2d, " 8	do. do.	drops, ℥ liv.	a little faint,—great relief to pressure and dyspnœa.	crackling immediately.	Oct. 6, percussion equal both backs and respiration pure.
22.	32. Sept. 28, 1853.	Lawyer.	none.	6 months.	1st, Oct. 2	do.	℥ lxxvi.	felt a little weak.	heart fell tow'ds place 1½ inches; murmur heard indistinctly.	grad'l improvement from time of operation. Under treatment.

* N. B.—The patient had been operated on by Dr. Wyman many times.

Tabular Statement of Operations for Paracentesis Thoracis.—Continued.

No.	Age and Date.	Profession.	Previous diseases.	How long sick before first operation.	No. of operations and dates.	Character of the fluid.	Amount of the fluid.	Immediate effects of the operation.	How soon the lungs expanded and heart fell into normal position.	Final result.
23.	40. Oct. 14, 1853	Laborer.	none.	8½ months.	1st, Oct. 21	pus.	℥ lxiv.	cough considerable—one or two bloody sputa——much relieved of weight—able to lie on either side.	lung did not easily come up, air took place of fluid.	lung very slowly expanding—still much air, no return of fluid in pleura; under treatment.
24.	21. Oct. 20, 1853.	Farmer.	none.	6½ months.	1st, Oct. 20	pus.	℥ xxiv.	relieved from pressure.	murmur along vertebræ, and crackling lower down.	improving in strength, &c. under treatment.
25.	30.? Sept. 28, 1853.	Merchant.	cough for months.	3 months.	1st, Oct. 1		nothing.	no effect, either unpleasant or otherwise.		